

coming almost a uniform bright green and then fading to yellow as the leaves wither. But as yet we have sought in vain for unmottled forms of *young* *E. albidum* mentioned in the botanies. The third species, *E. mesochoreum* is never mottled, especially when young, though we have found a few specimens that showed a faint mottling in lighter shades of green when the season was much advanced. The leaves of this species are also much narrower and longer than those of either the other two, being mostly linear-lanceolate, and indeed even linear in some specimens.

The habitat of these plants is also characteristic, *E. albidum* and *E. Americanum* preferring deep shaded ravines and moist meadows, while *E. mesochoreum* takes to the hill-tops and the north facing slopes whether wooded, or open and covered with grass.

The color of the sepals is also distinctive, *E. Americanum* being yellow with purple dots at the base, *E. albidum* white tinged with pink, and *E. mesochoreum* also white, but tinged with lavender or blue. The perianth of the last is usually much longer than that of *E. albidum* and is not so much reflexed in the bright sunshine.

The stigmas of *E. Americanum* are peculiar, being massed into a club-shaped body; those of *E. albidum* are quite divergent and somewhat recurved; while in *E. mesochoreum* they are more slender and decidedly recurved. The capsules of this last species are also much larger and longer than those of either the other two and everything indicates that the seed is also more vigorous, a fact naturally to be expected, seeing that this form propagates rather sparingly by the bulb.

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BRIEFER ARTICLES.

Notes upon *Daucus Carota*.¹—The early introduction of this plant, from its European soil and environments, and its present wide distribution, and ready adaptation to new conditions make it a good type from which to expect those variations of habit, structure, etc., which usually attend the transplanting of a new organism with new conditions. Records of the numerous changes which it has undergone

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prove that it is no exception to the general laws of variation. Leaving out of all account the extended variation among the cultivated varieties which are quite as marked as among others of its congeners, my purpose in this note is to call attention to the range of variations to be found in the weed in a state of nature. This tendency is quite marked, and has often been noted. One of the more common and constant phases of variability is to be found in the floral umbel. The presence of a single, central flower, springing from the immediate center of the disk, and of a deep purple color, in distinction from the generally pure white of the entire umbel, is a feature that has been known for some time, though I am not aware that any record has appeared in any recent literature.

Another feature nearly as general and constant is the presence of a peripheral circle of larger flowers, mostly sterile and radial, though this is not universally the case, and for this reason, as probably in the preceding case no special record has been made of the fact.

During the present summer I have observed certain other variant phases which seem to be somewhat new, as a very considerable extent of inquiry among leading botanists has failed to elicit any corresponding observations. The features to which reference is here made are two. *First:* The extension of the unique colored and sterile features of the central flower to the whole central umbel. This I have noted in quite a large number of cases. *Second:* The implication of the entire umbel in the coloration. This feature was by no means as general as the last, but was quite marked in many individuals. My first thought upon observing it somewhat casually was that it was probably due to the same cause which leads to the assumption of purplish hues by many white flowers as they age toward withering. Subsequent observations, however, showed that this could not be the case; as in those plants exhibiting the phenomenon at all, it was quite as marked in the earlier phase of flowering as at any other. This, together with the observed tendency of the central purple flower to involve the whole central umbel in its peculiar color, renders very strong the conviction that it is a case of variation, which in time may become quite general and permanent.

My first observations on these points were made in the vicinity of Cold Spring, L. I., but have subsequently been verified upon specimens in this vicinity, and I doubt not may be found occasionally in many localities, though I had not noticed them at all in the middle western states.

It is quite remarkable that notwithstanding these and other features of variation, the divergence has not been sufficiently marked or con-

stant in any one direction to give rise to new species, or even to well marked varieties.—CHARLES W. HARGITT, *Syracuse University, Syracuse, N. Y.*

Cross and self-fertilization.—In a series of experiments, still in progress at this college, on the fertilization of the common petunia, the following results were obtained from the first generation.

One dozen petunias of equal vigor were selected from the greenhouse cuttings, and put into pots of equal size, and subjected to exactly the same conditions. About half of the plants were the dull purple variety, nearly the original type, while the others were variegated and somewhat modified. Each blossom was very carefully excluded from accidental fertilization, by being tied in a paper bag, or by having the corolla tied together tightly until the capsule had begun to develop.

There were three series of experiments. The blossoms of series I were self-fertilized; those in series II were fertilized from other blossoms on the same plant; and in series III they were fertilized from other plants.

Series I bore capsules averaging 1.8 centigrams in weight, series II bore capsules averaging 2.7 cgms. in weight, and series III bore capsules averaging 4.1 cgms.

In series I and III, the seeds of the plain purple and the variegated specimens were weighed separately, showing the variegated to be lighter. In series I the purple weighed 0.7 cgm. more than the variegated in the same series. In series III the purple bore capsules 0.2 cgm. heavier than the variegated in the same series.

It was also noted that many more capsules in series III developed and ripened perfectly than in either series I or II; while series I ripened the smallest percentage of capsules. Owing to various accidents no definite figures could be obtained to show the exact proportions.

Thus it may be inferred that even in the first generation the deteriorating effects of self-fertilization are plainly shown; and also the tendency of much modified plants to decline in vigor and productiveness.

Darwin, in his book on cross and self-fertilized plants, page 189, says: "In crossing six blossoms, there were six seed capsules produced, weighing 4.44 grains; while six others were self-fertilized, producing only three capsules weighing but 1.49 grains."

This experiment is interesting from the fact that it agrees with Darwin's very similar experiment on the same plants.—MINNIE REED, *State Agricultural College, Manhattan, Kas.*